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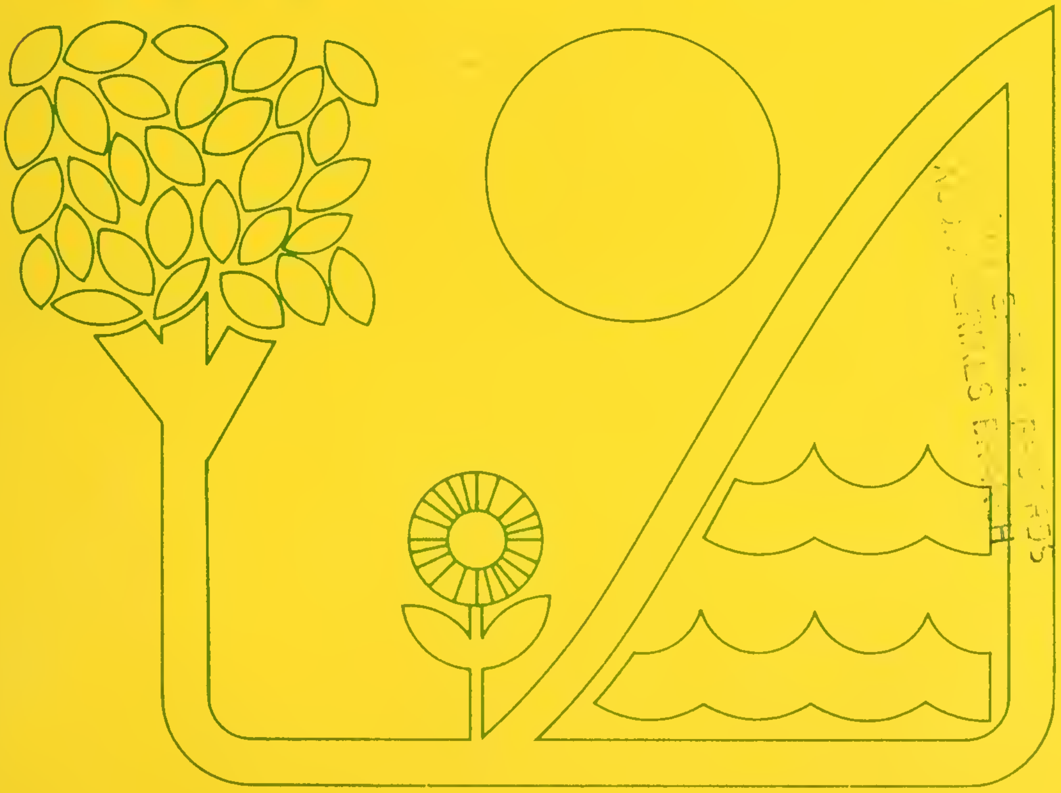

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LAND-USE POLICY AND FARMLAND RETENTION:
THE UNITED STATES' EXPERIENCE*

No. 28

by

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* A report prepared for the Organization for Economic Cooperation and Development, Paris, France.

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LAND-USE POLICY AND FARMLAND RETENTION:
THE UNITED STATES' EXPERIENCE [1/]

The use of land is an important issue in the United States. But this has not always been true. The American economy has a strong foundation in private property, economic freedom of private decision makers, and a reliance upon the market (price) system for resource allocation. Hence, private decisions on the use of land have been largely unregulated, and the allocation of land between uses outside of metropolitan areas historically has been almost totally determined by market forces.

There was not a widely recognized need for public intervention in the past. However, there is now an increased awareness of the inability of the traditional market system to achieve the public interest in land use, of the existence of high social costs of uncontrolled or ill-regulated private development, and of the need for public land-use policies to assure sound land management.

Public land-use objectives in the context of agricultural land are multidimensional. Frequently cited objectives include: maintenance of national agricultural production capacity to meet future domestic food and fiber demands,[2/] to mitigate world food shortfalls (for political and/or humanitarian purposes), and to provide foreign exchange; maintenance of the viability of agriculturally based communities and the contribution of agriculture to the state or local economy; stimulation of orderly urban/suburban expansion to reduce the high public service costs of discontiguous, unplanned expansion; maintenance of land in open-space uses to protect the aesthetic quality of a landscape and/or

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[1/] The frequently used phrase "farmland preservation" will not appear in this report. Preservation suggests absolute inflexibility--that farmland must be saved regardless of cost. Farmland retention is meant to imply that options are being kept open--that in the future the public interest might best be served by high-rise development on cropland under one set of circumstances and permanent "preservation" as cropland under another.

[2/] Recent studies indicate that the U. S. agricultural land base will be more than adequate to meet projected domestic food and fiber demands well beyond the year 2000 (Anderson, et al., 1975), (Cotner, 1976), (Heady, 1975) and (U. S. Department of Agriculture, 1975). However, sufficient uncertainty exists regarding factors affecting future productivity (energy costs, water availability, environmental restrictions, a declining rate of advancement in agricultural technology, etc.) to warrant continued concern over farmland retention from the national perspective.

to prevent deterioration of air and water quality.

Effective public governance in this context requires the use of appropriate land resource protection programs to guide private land-use decisions toward public goals. There are, however, important limitations on the scope of land-use policy in the United States. As stated by Anderson, et al. (1975) "Land policy has been significantly influenced, if not dictated, by the power or authorities available at different levels of government".

Distribution of Decision-Making Authority

The Federal Role

Actions at the federal level universally recognize the primacy of state authority under the U. S. Constitution to control the use of private land. The national land-use policy proposals debated in the U. S. Congress over the past few years illustrate this fact. All the proposals focus on procedure rather than substance. The approach is to provide federal grants to encourage planning by the states and to "provide impetus for initiatives underway in some states to take back certain land-use control authorities historically delegated to local governments. It has been characterized as federal enabling legislation to encourage states to exercise states rights" (Anderson, et al. 1975).

While the federal role is indirect, its influence is not inconsequential. For example, it has been reported that about 75 major federal legislative enactments, policy statements, and government reorganizational efforts for the period 1944-71 were related to land use (U. S. Senate, Committee on Interior and Insular Affairs, 1972). More specifically, federal tax policy (capital gains taxation, deductibility of property taxes and mortgage interest from taxable income, tax exemption for municipal bonds, etc.), federal transportation policy, and federal housing finance policies have, in effect, been major stimulants to suburban sprawl (Raup, 1975).

It is not likely that the federal role in agricultural land-use policy will become a major one because nearly all cropland in the U. S. is in private ownership (U. S. Department of Agriculture, 1974), and because the constitutional authority for public governance of private land will remain with the states. The federal government is not unconcerned, however, about the irreversible conversion of farmland to other uses. The U. S. Council on Environmental Quality recently declared that federal agencies must include an analysis of the effects of their proposed actions on "prime and unique" farmlands in their environmental impact statements.

The State Role

The unit of government with the broadest authority over the use of private land under the U. S. Constitutional system is the state. Police (regulatory) powers are reserved to the states in the U. S. Constitution. However, this authority has traditionally been delegated to local governments. More recently, states have begun to selectively exercise increased authority, particularly in the creation and administration of programs for coastal zone management, wetlands management, power plant siting and surface mining (Linowes and Allensworth, 1975). In the future an increased role of the states in land-use management is anticipated because of continued disappointment with the performance of fragmented local governments, recognition of the need to bring factors of other than local concern into the planning and policy-making process, and the need for all those significantly affected by development decisions to play a role in making those decisions (Council of State Governments, 1975).

The role of the states in farmland retention has been evident primarily in the enactment of use-value property tax assessment programs to stimulate retention of land in agricultural and other open-space uses. The most recent count indicates that 42 of the 50 states have programs for the assessment of agricultural lands at use-value rather than market value for property tax purposes. As will be discussed in a subsequent section of this report, use-value assessment programs have not been a notably effective approach to farmland retention.

The Role of Local Governments

Local governments have historically played the most active role in land-use management in the United States. Local governments have exercised their authority primarily through locally administered zoning. [3/] Local zoning authority is derived from state enabling legislation. These state laws usually permit, rather than require, local governments to designate districts (zones) for specific uses such as commercial, residential, industrial,

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[3/] For further detail on the experience with zoning in the United States see: Babcock (1966), Barlowe (1972), Delafons (1969) and Ervin, et al. (1977).

agricultural, etc.

Because of the reliance on zoning at the local level, it is not surprising that local efforts to maintain land in agricultural and other open-space uses have concentrated upon zoning. In a survey of rural zoning enabling legislation in 1968, it was found that 21 states had enacted legislation permitting local government establishment of agricultural zoning districts (Solberg and Pfister, 1972). By far the most prevalent form of agricultural zoning permits a variety of nonagricultural uses including nonfarm residences on small lots, home occupations, and other uses generally found in a residential district.

Local zoning is not commonly regarded as a promising public policy instrument for maintaining land in agricultural uses in the United States. It is clearly less popular than it once was. Seldom has agricultural zoning been relied upon in an earnest attempt to influence the allocation of land between uses. Typically, it has been the practice to zone residual lands to agricultural uses--after all commercial, residential, industrial and other uses have been accommodated, the remaining land is zoned agricultural. Under these circumstances zoning changes from agricultural to more intensive uses are easily obtained. Agricultural zoning has a history of impermanence in the United States. For some time, land-use analysts have pointed to the inability of locally administered zoning to achieve orderly growth and reduce the rate of conversion of agricultural lands to other uses (Babcock, 1966), (Clawson, 1971), (California Legislature, 1970). 4/

Direct vs. Indirect Approaches to Farmland Retention

There are two somewhat distinct strategies to farmland retention--indirect and direct. Urban/suburban land-use control techniques designed specifically to manage the forces generating or influencing land-use change near metropolitan areas can be considered indirect approaches to farmland retention. Reduction of the rate of conversion of agricultural lands to other uses is a by-product

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4/ As will be discussed in a subsequent section of this report, the role of zoning and other regulatory approaches to farmland retention may also be limited by the fifth amendment to the U. S. Constitution--"nor shall private property be taken for public use without just compensation". This issue (commonly referred to as the "taking issue") is the most controversial in land-use planning and policy in the United States. For a detailed discussion of this issue see: Bosselman (1973), Costonis (1975), and Reilly (1973).

of their effective design and implementation. Important urban/suburban growth management techniques include phased or sequential construction of publicly funded capital improvements (roads, schools, sewer and water facilities, etc.), building permit limitations, utility extension fees and/or restrictions, performance standards, interim building or utility extension moratoria, environmental impact controls, and urban service boundary restrictions. Detailed examination of these approaches is beyond the scope of this report. Those interested in reviewing the U. S. experience in urban/suburban growth management are referred to the recently completed three volume treatise, Management and Control of Growth, by the Urban Land Institute (1975).

Direct approaches to farmland retention are the main subject of this report. Direct approaches are those specifically designed to maintain land in agricultural and other open-space uses. They can be classified into three general categories: incentive programs, noncompensatory regulation, and compensatory regulation. The experience in the United States with each of these three types of land resource protection programs will be examined in turn.

Incentive Programs

Incentive programs are attempts to influence the allocation of land between uses by altering the economic stimuli upon which private land-use decisions are based. These are efforts to achieve the public interest in land use by persuasion rather than by coercion.

Use-Value Assessment

Property taxation has been an important fiscal instrument in the United States since colonial times. It remains the single most important source of revenue at the local level, amounting to $45.3 billion in 1973 (U. S. Department of Commerce, 1975).

Taxes on farm property amounted to $2.98 billion in 1974. Taxes on farm property were 7.5 percent of net farm income in 1974. In some of the more urbanized states, the ratio of farm property taxes relative to net farm income was substantially higher: Massachusetts, 19.8 percent; New Jersey, 16.6 percent; New York, 17.5 percent; and Rhode Island, 18.9 percent (U. S. Department of Agriculture, 1976).

Property taxes on agricultural and other open-space lands are normally levied on the basis of market value. The market value of agricultural land is often greater than its value in agricultural uses, particularly in the periphery of urbanizing areas. Assessed values and property taxes on rural land increase in direct proportion to market value. In many instances, property taxes on rural land exceed tax levels consistent with agricultural use of the land. It is often argued that excessively high property taxes force bona fide farmers to sell their land to speculator/developers well before the land is needed for nonfarm uses--resulting in excessive and premature idling of agricultural lands.

Programs to reduce property taxes on land in agricultural and other open-space uses have been the most widely adopted type of farmland retention program in the United States in the recent past. Maryland adopted the first such program in 1956. As of October 1975, 42 states had use-value assessment (also called differential assessment) programs (Council on Environmental Quality, 1975). Among the reasons for widespread adoption of use-value assessment programs are: (1) concern about the impact of premature and/or excessive conversion of agricultural land to urban/suburban uses in conjunction with the belief that reduced property taxes on farmland will reduce the rate of conversion; (2) the view that taxes on farm property are too high relative to farm income; and (3) a preference for incentives rather than regulation which do not reduce private property rights and are, therefore, more acceptable politically (Anderson, et al., 1975).

Use-value property tax assessment laws are of three general types (Hady and Sibold, 1974):

(a) *preferential assessment*, where land in agricultural and other open-space uses is assessed on the basis of value in use (rather than on the basis of market value), and no penalty is imposed if the land is converted out of farm or open-space uses;

(b) *deferred taxation*, which also provides for assessment on the basis of value in use, but some amount of the reduced property taxes must be paid when land is converted to ineligible uses; and

(c) *restrictive agreements*, where the landowner and local government agree to restrict the use of land for a period of years in exchange for property taxation based on value in use.

Thirteen states have preferential assessment laws, 24 have deferred taxation, and five have restrictive agreements (Regional Science Research Institute, 1976). Of the three types of use-value assessment programs, preferential assessment has the least potential for affecting land-use change; restrictive agreements, which require a landowner commitment to keep land in a specified use, are potentially the most effective type of land-use control technique.

Several studies of the performance of use-value assessment in the United States have recently been completed (Carman and Polson, 1971), (Gustafson and Wallace, 1975), (Henke, 1974), (International Association of Assessing Officers, 1974), (Regional Science Research Institute, 1976), and (Schwartz, 1976). These studies all basically conclude that use-value assessment is, at best, marginally effective in reducing the rate of conversion of farmland to other uses.

The program in California, The California Land Conservation Act (also popularly known as the Williamson Act), has been more intensively studied than any other. There is widespread interest in the California use-value assessment program because it is among the most restrictive in the country, it is among the largest, the program is expensive in terms of its fiscal impact, and California is the most populous as well as the most important agricultural state in the U. S. A brief summary of the California program is included here to provide an illustration of the structure, functioning, and performance of the use-value assessment approach.

The California program--Discontiguous urban/suburban expansion in California has reduced the agricultural land base. Over the last two decades, an estimated 15,000 to 20,000 acres of highly productive agricultural land have been lost to urban uses per year; an estimated one million acres of "prime" and "potential prime" land lie within the estimated 1985 urban development zone (California Office of Planning and Research, 1974). In addition, suburban sprawl has increased the cost of providing public services, had an undesirable aesthetic impact, and has adversely affected the economic viability of agriculture by stimulating speculation in rural land.

In an effort to diminish the impact of urban/suburban growth on the rural landscape, the California Legislature enacted the California Land Conservation Act of 1965. The act is enabling legislation which provides the legal framework for voluntary contracts between local governments and private owners of undeveloped land. The contract precludes any use of the land other than agricultural, recreation, open-space, or compatible uses for a minimum period of ten years. [5/] In return for the voluntary temporary forfeiture of the right to develop their land, participating landowners pay property taxes based upon the use-value, rather than market value, of their land. As each year passes, another year is automatically added to the contract term, unless notice of nonrenewal is served by either the landowner or the local government. Thus, in the absence of a nonrenewal notice, a sustained ten-year contract exists. When notice of nonrenewal is given, the contract remains in effect for the balance of the contract term. [6/]

Contracts are binding on those acquiring all or a portion of the original contracted parcel. Cities or counties acquiring jurisdiction of land under contract (via annexation, incorporation, or disincorporation) also acquire all the rights and responsibilities of the original governing body. However, when land is placed under contract within one mile of the exterior boundary of a city, the city may protest the contract and thereby obtain the right of not succeeding to the contract if the land is later annexed.

Agricultural use-value is derived from capitalization of agricultural income. Agricultural income is either the fair rent imputed to land (when sufficient rental information is available), or expected earnings of the land under good management (§ 423a, California Revenue and Taxation Code). The capitalization rate is determined by adding an interest component (based on a yield rate for long-term government bonds), a property tax component, a risk component, and a component for amortization of investment in perennials (§ 423b, California Revenue and Taxation Code).

Cancellation, when permitted, results in immediate release from all provisions of the contract. To terminate a contract via cancellation, the landowner must petition to the local jurisdictional authority (county board of supervisors or city council) for release. The board or council may approve the cancellation request only if it is determined that (1), cancellation is consistent with the purpose of the Act, and (2) cancellation of the contract is in the public interest (§ 51280-51286, California Government Code). In

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[5/] Nearly all contracts are for ten years.

[6/] Nonrenewal of a contract results in a gradual increasing of the property tax rate over the remainder of the contract term.

the event that approval is granted, the board or council may require the landowner to pay a cancellation penalty of up to a maximum of 50 percent of the assessed value of the land, based upon market value at the time of cancellation. The ratio of assessed to market value in California is approximately .25; hence, the maximum penalty is 12.5 percent of market value. The penalty may be waived when the board or council determines waiver to be in the public interest. Such action, however, is subject to review by the Secretary of the California Resources Agency.

In fiscal 1975-76, 14.4 million acres were under contract. This represents about 33 percent of the 43.8 million acres of privately-owned farmland and commercial forest land in California. Forty-seven of the 58 counties in California were participating in the program in 1975-76. Thirty-seven percent of the privately-owned farmland and commercial forest land in the 47 participating counties was under contract in 1975-76.

"Preservation of the limited supply of prime agricultural land" is an explicit objective of this legislation (§ 51220, California Government Code). 7/ Thirty-four percent of the 12.6 million acres of prime land in California was under contract in fiscal 1975-76. The 4.37 million acres of prime land under contract amounted to 30.3 percent of all land under contract in 1975-76.

7/ Prime land is defined as land meeting any of the following criteria:

(a) Class I or II of the Soil Conservation Service classification scheme;

(b) rates of 80-100 in the Storie Index rating:

(c) an annual livestock carrying capacity of one animal unit per acre;

(d) an annual gross revenue of at least $200 per year in unprocessed plant production in three out of the previous five years; or

(e) land in fruit or nut-bearing trees, vines, or bushes, which have less than a five-year nonbearing period and which normally return not less than $200 per acre annually (§ 51201, California Government Code).

Potential prime lands are "lands which have the capacity of being made prime through normal agricultural investment and management practices" (California Office of Planning and Research, 1974).

Participation in the program has increased dramatically since 1969. Acreage under contract has increased from 4.25 million acres to 14.43 million acres. Prime land under contract has increased nearly eight-fold--from .57 million acres in 1969-70 to 4.37 million acres in 1975-76.

Enrollments in the California Land Conservation Act cause reductions in the tax base of participating counties and municipalities. Hence, either local property tax revenues are decreased or the tax burden on other property must be increased to make up the difference. Property taxes foregone or shifted throughout the state in 1975-76 are estimated to be $60.5 million (Gustafson, 1977). This estimated shift, or loss, represents less than 1 percent of all property taxes levied in the 47 participating counties in 1975-76; it amounts to 15.0 percent of the taxes on all farm property in California in 1975.

The fiscal impact at the local level varies considerably because of the great variation among counties in the amount of land under contract. In 1975-76 the estimated tax shift or loss at the county level was over 5 percent of the county property tax levies in five counties; it exceeded 10 percent in three counties. The greatest impact was in Kings County--16.4 percent of county taxes levied (Gustafson, 1977).

Studies of this program indicate that it has not been an effective land-use management technique. The spatial characteristics of land under contract provide convincing evidence of the inability of the California Land Conservation Act to affect land-use patterns. Studies of land under contract in 1968-69 (Carman and Polson, 1971), 1971-72 (Gustafson, 1973) and 1973 (Schwartz, et al., 1976) all conclude that the level of participation near urban areas has been too low to have an impact on the conversion of agricultural land to other uses. Participation has been concentrated in remotely located areas with minimal potential for conversion to urban/suburban uses. Moreover, the scattered and unsystematic patterns of land under contract in the periphery of expanding communities may actually stimulate, rather than prevent, discontiguous suburban growth (Gustafson and Wallace, 1975).

There are two basic reasons why the California Land Conservation Act has been ineffective as a land-use management technique. First, the incentive of use-value assessment is not large enough, particularly in the rural-urban fringe, to induce sufficient participation to affect the allocation of land between uses.

Second, unsystematic implementation of the California Land Conservation Act by local governments has limited its potential effectiveness as a land-use management technique. As with all state authorized, locally administered land-use management programs (e.g., zoning, subdivision regulation), the effectiveness of this program as a land-use control or guidance technique is closely dependent on the effectiveness of local land-use planning processes and how well the program is integrated with local planning processes. In this context, the initiation of contracts under the Act is an important and revealing dimension of local public administration of this program. It is evident that the state legislature intended local governments to initiate this process through the designation of "agricultural preserves" which establish the eligibility of land for use-value assessment. However, the language of the Act is sufficiently vague to permit landowner initiation of the contract process. When landowners intiate this process, local governments administer the program in response to landowner requests for "agricultural preserve" designation.

Landowner initiation is the most widely used method of contract origination throughout the state. Although local governments have the authority to take the initiative and designate lands eligible for use-value assessment, this authority has not been exercised by most counties. Landowner initiation contributes to random and unsystematic patterns of land under contract, which further limits the effect of this program on the allocation of land between uses, particularly in the rural-urban fringe.

Concluding comments on use-value assessment. Lessons learned from the California program seem applicable to use-value assessment programs in other states. Because the California program is among the most restrictive in the country, conclusions concerning its effectiveness suggest that no use-value assessment program in the country is, by itself, an effective instrument of land-use policy. Two recent comprehensive studies of the effectiveness of use-value assessment in the United States conclude that such programs can have relatively little impact on the rate, timing or spatial distribution of the conversion of agricultural and other open-space lands to other uses (International Association of Assessing Officers, 1974) and (Regional Science Research Institute, 1976). The cumulative weight of the evidence of the limited effect of use-value assessment on land use seems incontestable.

Although the record of use-value assessment for maintaining land in agricultural use has been unsatisfactory, the prospects for improving the effectiveness of this approach appear promising. Suggestions from the research community for legislative revision of use-value assessment programs include:

1. All programs should at least provide for deferred taxation; interest should be charged on the deferred tax benefits; and, since the benefits of farmland and open-space conservation extend beyond the boundaries of local taxing jurisdictions, partial compensation should be provided by states to local governments for tax revenue decreases resulting from use-value assessment on agricultural and other open-space lands (Regional Science Research Institute, 1976).
2. Limit eligibility for assessment at use-value only to contiguous blocks of land large enough to be economically viable, specifically designated (from planning studies of agricultural capability, development and growth projections, etc.) for agricultural and other open-space uses, and under strict nonvoluntary land-use controls which restrict the conversion of land to ineligible uses (Gustafson and Wallace, 1975), (Regional Science Research Institute, 1976).

   Limited experience in the use of differential assessment in conjunction with agricultural zoning in California (Napa County) indicates that this combination of land-use policy instruments may be highly complementary (Gustafson and Wallace, 1975). Taxation consistent with agricultural and open-space zoning may strengthen the case for its regulation.

Agricultural Districts

In 1971 New York State enacted an Agricultural District Law. This program provides for deferred taxation of agricultural lands. But it also contains important additional provisions which make it considerably more comprehensive than a typical deferred taxation program. Because of the uniqueness of this approach and because other states are considering similar programs, it merits special attention in this report.

New York's agricultural district law is enabling legislation which provides farmers "an opportunity to protect themselves from some of the rising costs and governmental actions associated with urbanization" (Bryant and Conklin, 1975). Agricultural districts (minimum size of 500 acres) are usually created by landowner petition to the county legislative body.[8/] Approval for the creation of a district is required by both the county and state governments. The approval process includes extensive review by the public and by county and state planning and advisory offices. Once approved, districts may be re-examined every eight years. At that time termination, modification and continuation options are considered.

The following provisions apply within all agricultural districts (Conklin and Bryant, 1974):

1. Farmers, upon annual application, may obtain an exemption from property taxation on the value of their land in excess of its value for farming. To be eligible, a farmer must own a minimum of ten acres used the preceding two years for agricultural production having an annual gross sales value of $10,000 or more. Land receiving this exeption is subject to a maximum five-year tax rollback (payment of reduced taxes) if the land is converted to nonfarm uses.

2. Local governments are prohibited from enacting ordinances that would restrict farm structures or farm practices beyond the requirements of health and safety.

3. State agencies must modify administrative regulations and procedures to encourage the maintenance of commercial agriculture to the extent compatible with health, safety and applicable federal regulations.

4. The right of public agencies to acquire farmland in agricultural districts by eminent domain is modified--before good farmland can be taken for public uses, serious consideration must be given to alternative locations.

5. The right of public agencies to advance funds for sewer, water and other facilities that would stimulate nonfarm development in agricultural districts is limited.

6. The power to impose special property tax levies on farmland for sewer, water, lighting and nonfarm drainage is limited.

As of mid-1975, over 200 agricultural districts covering over 2.5 million acres had been formed (Bryant and Conklin, 1975). This is about 25 percent

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[8/] The law also provides for state creation of agricultural districts to protect "unique and irreplaceable" agricultural lands. As of mid-1975, however, the state had not exercised its authority to create districts. According to some observers, the state is unlikely to exercise this authority for some time because of satisfaction with the rapid rate and orderly manner of district formation by local initiative (Bryant and Conklin, 1975).

of the farmland in New York State. Districts were located in 44 of the states' 57 agricultural counties and in all agricultural areas of the state except those nearest New York City, such as Long Island. The typical district is 10,300 acres in size and contains 40 farms (Bills, 1975).

The effectiveness of New York's agricultural district program cannot yet be adequately evaluated due to limited experience and empirical evidence of its impacts. There are indications, however, that the agricultural districting approach may be more effective in areas under some urban pressures yet still basically rural in character than in the rural-urban fringe. No districts have yet been created in rural-urban fringe settings dominated by urban/suburban influences and in which the chance for a nonfarm sale in the next five years is very high (Bryant and Conklin, 1975).

Landowner participation in the New York program is voluntary. Thus, if the approach is to be effective in the rural-urban fringe and stimulate more orderly and efficient suburban expansion, the advantages to landowners must outweigh the disadvantages. In the rural-urban fringe flexibility of use is important to the landowner and becomes more important as the probability and/or the expectation of realizing a large capital gain increases. The incentive for owners of farmland near expanding incorporated areas in New York to keep their options open may exceed the private benefits of participation in the agricultural districting program since farmers in the rural-urban fringe are apparently "not willing to voluntarily form an agricultural district and possibly sacrifice their chances for a nonfarm sale" (Bryant and Conklin, 1975).

Voluntary Sale of Development Rights--Suffolk County

Suffolk County, New York is located on eastern Long Island. The county has a population in excess of 1.25 million and a history of rapid suburban growth. Farmland in the county declined from 123,000 acres in 1950 to an estimated 45,000 acres in 1974. Yet Suffolk remains among the most important agricultural counties in New York State.

In response to continued reductions in the county's farmland base and the inability of the New York agricultural districting program to alleviate this problem (no districts have been formed in Suffolk County), in 1974 the Suffolk County Legislature authorized the expenditure of public funds for the acquisition of development rights on privately-owned farmland. The program provides for municipal purchase of farmland development rights voluntarily offered for sale. Private landowners would retain title to their land under this program but would no longer possess the right to develop the property.

Offers for the sale of development rights would be solicited at specific times. Farmland owners may submit offers to the county to sell the development rights on all or part of their holdings. An appointed advisory group will review the offers and make recommendations to the Suffolk County Legislature on which offers to accept.

The county plans to spend about $60 million (to be raised from the sale of 30-year municipal bonds) to purchase the development rights on an estimated 10,000-15,000 acres of noncoastal farmland. Priority is to be given to the purchase of development rights on farmland in contiguous blocks of at least 200 acres, which have the best soils, and are under the greatest development pressure (Bryant and Conklin, 1975).

Progress in implementing this program was stalled in 1976 due to concern over the impact of the program on the county's long-term financial position and the view among some Suffolk County legislators that the program would unjustly benefit land speculators (Land Use Planning Reports, 1976). As of January, 1977 the county had authorized the initial phase of the acquisition program. This phase involves purchase of development rights on 3,883 acres at an estimated cost of $21 million. 9/

The effectiveness of the Suffolk County approach is difficult to assess. Clearly it is effective in retaining the farmland to which the county acquires development rights. However, this approach has obvious limitations. It is expensive--perhaps prohibitively expensive to all but the most financially sound local governments in the country. 10/ Some analysts would argue that it provides excessive compensation to landowners. This approach assumes that government must purchase for public use rights having value largely created by the actions of government itself (public investments in streets, schools,

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9/ This is about $5,400 per acre. The approximate agricultural value of an acre of farmland in Suffolk County was $1,500 in 1975 (Bryant and Conklin, 1975).

10/ In 1969 Suffolk was among the top 2 percent of U. S. counties in median family income (U. S. Bureau of the Census, 1972).

sewers, etc.). As described by Costonis (1975), such approaches "require that the landowner's award include both the land's value under existing land-use restrictions *and* the premium that the market places on it in anticipation of future relaxations of these restrictions that will increase its value" (p. 1043). In addition, development rights purchased on a voluntary offer system may be too weak a mechanism for retaining farmland in contiguous blocks large enough to be economically viable (Kolesar and Scholl, 1975).

Regulatory Programs for Farmland Retention

In contrast to incentive programs which involve somewhat more subtle methods of guiding private decisions toward public goals, regulation involves direct public intervention to restrict the uses of privately-owned land. Private landowners are involuntary participants in regulatory efforts to achieve land resource protection objectives.

With the possible exception of locally administered rural zoning authorized by state enabling legislation (discussed earlier in this report), regulatory approaches for the retention of agricultural and other open-space lands have not been widely adopted in the United States. There are indications that the role of public regulation over private property rights in agricultural and other open-space land may increase in the future. However, progress in the design and implementation of effective regulatory programs has been slow because of uncertainty about how far regulation can go before government must compensate landowners for regulation-induced reductions in property value.

The conditions under which the regulation of private property rights in land must be compensated is the most widely debated land-use issue in the United States. Those supporting compensation argue that the "taking clause" (fifth amendment) of the U. S. Constitution protects the right of the individual to do whatever he wants with his land regardless of its impact on society; any restriction of private rights represents a "taking" (of private property value). Hence, government is compelled to compensate when it regulates all but nuisance-like land uses (e.g., regulation of the location of slaughterhouses, airports, etc.)

Supporters of noncompensatory regulation, on the other hand, argue that the risk of noncompensatory regulation being found unconstitutional is more imagined than real--"that the fear of the taking clause is stronger than the taking clause itself" (Bosselman, et al., 1973). They point to the recent (late 1960's and early 1970's) tendency of the courts to approve noncompensatory land-use regulations, particularly if the importance of the public purpose served by the regulation is well demonstrated. Hence, they advocate for the position that "... a regulation of the use of land, if reasonably related to a valid public purpose, can never constitute a taking" (Bosselman, et al., 1973).

This is obviously a complex issue which cannot be dwelled upon at length in this report. Its resolution will require further clarification of the rights and obligations of society and those of property owners. Those searching for a middle ground emphasize the need for programs which simultaneously avoid the prohibitive burden on the public purse of full compensation alternatives and the fierce political backlash generated by noncompensatory regulation (Costonis, 1975).

The limited experience in the United States with regulatory approaches to farmland retention is discussed in the following two sections. To provide additional insight into the changing role of regulation in agricultural and open-space land-use policy, selected important legislative proposals for an increased regulatory role have also been included in this presentation.

Noncompensatory Regulation

Statewide Zoning in Hawaii

In 1961 (two years after achieving statehood) Hawaii adopted a statewide land-use plan and statewide zoning. It remains the only state that has done either. Because the Hawaii experience is unique and involves an element of state control over the conversion of agricultural land to other uses, it is a particularly appropriate program for discussion in this report.

In anticipation of rapid urban expansion and the potential loss of the state's limited supply of agricultural land, the state legislature created the Hawaii State Land Use Commission and authorized it to zone all land in the state into four classes of use. The commission is a nine-member body--seven lay members are appointed by the state governor and the other two members are heads of two resource-oriented state agencies.

The four zoning classes established by the legislation are:
1. urban, 2. rural, 3. agricultural, and 4. conservation.

> The urban zone is for land that is developed or that is planned for development in the next ten years.

> The rural zone is for land that is in relatively low-density urban uses or that contains small farms and land holdings (the character of improvements or ownership patterns serves as the basis for the zone).
>
> The agricultural zone is for land under intensive cultivation or capable of such use and land that is developed or planned for residential uses in lots of one acre or more.
>
> The conservation zone is for state-owned forest and water reserve districts, privately held mountainous lands, and other property with significant scenic and environmental value (Linowes and Allensworth, 1975).

The Land Use Commission was given the authority to set boundaries for the zoning districts and to review district boundaries every five years. The district boundaries were established in 1964. No major adjustment in the boundaries has occurred since 1964. The changes which have occurred have been cases of individual rezonings--usually expansion of the urban district. About 10,000 acres were reclassified to urban use in the first boundary review in 1969. In the second boundary review in 1974, 5,400 acres were changed to urban use (changes were requested on more than 14,000 acres) and over 4,000 acres were taken out of the urban district and reclassified to agriculture or conservation uses (Myers, 1976).

Local governments have retained considerable responsibility under the Hawaii Land Use Law. The state has exclusive responsibility only in the conservation zone (most land in this zone is state-owned). In the other three zones a dual system of regulatory authority exists. State controls are broad and general while local controls are more specific.

In the agricultural and rural zones, local governments (counties) have the authority to issue "use permits" (for development of land in large lot residences, etc.) which are subject to state veto. Since the state veto power is very seldom exercised, local governments have a great deal of responsibility for determination of uses in the agricultural and rural zones.

Local governments have even greater authority within the urban zone. State powers are limited to designation of the zone. Local governments determine specific uses (apartments, commercial, industrial, single-family residential, etc.). As stated by the former head of the Hawaii Planning Department, "Local authority in urban districts is so great that urban zoning is administered solely by the counties" (Mark, 1973).

It is difficult to assess the performance of statewide zoning in

Hawaii. On the positive side, the Hawaii Law, the boldest statewide land-use management effort in the United States to date, has stood up for 15 years and its political stability appears assured. As stated in a recent study of the Hawaii Law by Myers (1976), "In a decade of enormous growth pressures, the law has preserved land options that otherwise would have been lost". Had there been no law it is very probable that more land would have been converted to urban/suburban uses. Thus, to some extent, the law has been successful in containing urban pressures and achieving more efficient use of urban land.

However, as pointed out by analysts of the Hawaii experience, the program is not without serious weaknesses. It has been estimated that on Oahu (where 80 percent of Hawaii's population resides) there is enough land in the urban district to meet development needs for the next two decades (Linowes and Allensworth, 1975). It has been argued that state planning has been inadequate and not integrated with statewide zoning; this situation suggests that the Hawaii program may not be sufficiently dynamic to facilitate effective land-use management. It has also been pointed out that, for all practical purposes, local government has final control over the regulation of land-use change in Hawaii. The findings indicate that land-use management in Hawaii may not be as unique as is commonly assumed.

In response to criticism of its land-use law, in 1975 the Hawaii legislature amended the law. These amendments are expected to significantly change land-use control in Hawaii (Myers, 1976). Important amendments included:

> Establishment of a planning council to prepare a "comprehensive plan and policies" to serve as a guide for the "long range development of the state". The council will monitor the implementation of the plan. Once the plan is adopted, all Land Use Commission boundary amendments and other actions will have to "conform" to it.
>
> An Interim Statewide Land Use Guidance Policy was passed. It will reflect a broadened emphasis from the original focus on agricultural lands to overall growth management. The policy contains general guidelines for land reclassification, establishment of district boundaries, etc. The commission must "observe and comply" with the Guidance Policy except when an "injustice or inequity will result" (Myers, 1976).

It is as yet unclear whether these changes will significantly improve the effectiveness of Hawaii's legislation. The mixed record with statewide zoning to date suggests that the mere existence of statewide land-use regulatory powers does not guarantee effective land-use management. Results of analyses of the Hawaii experience emphasize the need for specificity in state guidelines, the thorough integration of planning with regulation, and more carefully delineated lines of authority over specific land uses and types of land-use change.

Farmland Conversion Regulation: The California Proposal

A potentially important but as yet untried method of farmland retention in the United States involves state-imposed restrictions on the conversion of farmland to nonfarm uses. This approach need not entail direct planning and regulation by the states. Instead, it would provide for local government regulation of the conversion of farmland to nonfarm uses in accordance with criteria and standards established by the state, and with local decision making subject to state review and approval. This is a noncompensatory regulation approach and is, in essence, a "critical areas" program for farmland involving: (1) state declaration that the public interest in farmland retention is significant and is of more than purely local interest (thus requiring an element of area wide or state level management), (2) state definition and designation of the lands to be protected, and (3) state supervision of local regulation of farmland conversions. [11/]

A program of this type has been under active consideration in California for the last two years. [12/] The proposed California legislation, which would establish a program of state-mandated, locally administered regulation of farmland conversions, is specifically designed to conserve "prime" agricultural lands. [13/] If enacted, this program would prohibit the conversion of prime agricultural land to nonagricultural uses except under specific circumstances. All land so restricted would be assessed for property tax purposes on the basis of value in use.

This program would be administered at the state level by an "Agricultural Resources Council". The council would be composed of 12 members--three appointees representing counties, three appointees representing cities, three

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[11/] The "critical areas" concept is receiving increased attention in land use circles in the U. S. For an overview of critical areas programs see: Countil of State Governments (1975), Healy (1976), and Mandelker (1975).

[12/] Assembly Bill 15, introduced before the California Legislature in December, 1974. This legislation is also known as the California Agricultural Lands Act.

[13/] For the current definition of "prime" agricultural lands in California, see footnote 7. Somewhat modified definitions have been proposed in A. B. 15 and other legislation still under consideration in the California Legislature.

appointees representing the public, and the chief administrators of three state agencies. Council members would serve four-year terms. The responsibilities of the council include: adoption of regulations prescribing which land uses are permitted within areas designated as prime agricultural land, establishment of standards and criteria to be used by local governments in determining whether prime land can be converted to nonagricultural uses and/or subdivided, and review of the administrative decisions of local governments in implementing this program.[14/]

As of January, 1977 the political fate of the California proposal is still uncertain. To become law the proposal must be approved by a majority in both bodies of the California Legislature and then by the Governor. In 1976, it was approved by one legislative body but was defeated in a subcommittee of the other. Agricultural organizations, the real estate and development communities, and organized labor were among those lobbying against the adoption of this legislation. Supporters of this measure plan to re-introduce it before the legislature in 1977.

If this measure were adopted, it would establish an innovative land-use management program for the 12.6 million acres of prime land in California (about one-third of the privately-owned farmland in the state). All conversions of prime farmland to nonagricultural uses would be required to pass a public interest test of some specificity and which incorporates considerations of more than local concern. This program, however, would not apply to the 30 million acres of privately-owned nonprime farm and forest land in California. Some observers may view this as a serious defect in program design. Nevertheless, there may be important advantages to a highly specialized program of this type. The political feasibility and constitutional validity of noncompensatory regulation of farmland conversions is unquestionably strengthened by limiting this program to those lands best suited to agricultural production.

Regardless of the fate of the California proposal, it is very likely that the concept of farmland conversion regulation will receive increased

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[14/] It should be noted that the review authority of the council is limited. The proposed legislation states that in reviewing the determination of a local governing body "the council shall not exercise its independent judgment on the evidence, but shall only determine whether the decision of the governing body was supported by substantial evidence in light of the record as a whole".

attention from those concerned with the impact of urban/suburban growth on the rural landscape and the economic viability of agriculture in rural-urban fringe areas of the United States. The strengths of this approach include: it is a straightforward method of influencing the rate, timing and spatial distribution of farmland conversions; it can be used to provide an element of state influence in rural land-use management while not significantly eroding local government authority; it will stimulate in-filling (development on idle undeveloped land in areas already largely developed) and the substitution (in development) of lands low in agricultural productivity for lands high in agricultural productivity; its economic feasibility is not impaired by an excessive compensation burden on the public purse; if limited to highly productive farmland, the political feasibility and constitutional legitimacy of this approach can be enhanced by (1) a thorough documentation of the public purpose to be served, and (2) by careful specification of the conditions under which conversion is consistent with the public interest.

The most serious limitation of this approach is that it is based on single-purpose planning and regulation--it is not "comprehensive". Those arguing this point will emphasize the need for programs which give full and equal consideration to agriculture, housing, transportation, recreation, commerce, and industry. Single-purpose measures cannot adequately reflect parallel concerns for both preservation and growth. The merits of these arguments will be debated at length in the future. It may well be the case, however, that multi-purpose programs, by the very fact of their comprehensiveness, will encounter substantial political resistance. Hence, if any progress is to be made in reducing the rate of conversion of farmland to nonfarm uses, highly specific single-purpose programs may be a more feasible alternative for some time into the future.

Compensatory Regulation

In the absence of clear guidelines on the constitutionality and/or political acceptability of noncompensatory regulation, state and local governments have been hesitant to impose broad-based land-use management programs involving regulation without compensation. Consequently, increased attention has been focused on programs of compensatory regulation.

Public Purchase of Development Rights

Of all the methods of maintaining land in agricultural and other open space uses, the most straightforward is public acquisition of the right to develop the land. This permits the land to remain in private ownership with development permanently prohibited. This approach can involve either public purchase of development rights on unrestricted lands which are voluntarily offered for sale (as in Suffolk County, New York), or the purchase of development rights on land designated by state or local governments to remain in agricultural or other open-space uses. The latter approach, involving compensation for losses in value resulting from involuntary restrictions on the use of private land, is the subject of discussion in this section.

An extensive program of this type has not yet been adopted anywhere in the United States. However, proposals for public purchase of development rights on land permanently restricted to agricultural uses have been under consideration in three states: New Jersey, Maryland, and Connecticut. 15/

Typically, these proposals involve development rights purchase programs jointly administered by state and local governments. Each local government would be required to designate a specified amount or percentage of its farmland for agricultural and compatible uses. Development on this land would be prohibited. If a local government failed to designate the minimum amount of land for exclusive agricultural and/or open-space uses within a specified period, the state would designate it. Owners of restricted lands could sell the "development easement" (right to convert the land to more intensive uses) to their land to the state. The price of the development right would be the difference between the market value of the land and its value in agricultural use (commonly from 50 percent to 80 percent of the value of farmland). Landowners could choose when they wanted to sell development rights.

The lack of progress in implementing an extensive program of this type is an indication that public representatives are not completely satisfied with this approach. The most serious limitation of these proposals is their

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15/ The program as originally proposed in New Jersey involved public purchase of development rights to compensate landowners for regulation-induced reductions in property value on prime land in designated "agricultural preserves". (Kolesar and Scholl, 1975). This program failed to be implemented primarily for fiscal/political reasons. Instead, a $5 million demonstration project has been enacted (Chumney, 1976). However, this pilot project differs significantly from the original proposal in that it is limited to only those lands to which development rights are voluntarily offered for sale (similar to the program in Suffolk County, New York).

cost. At a time when public revenue sources are coming under increasing stress, it is increasingly difficult to establish new revenue sources with the financial capability to cover the costs of an extensive state-wide public purchase of development rights program. In addition, this approach has been criticized as being overly generous to farmland owners. The state would be required to pay speculatively escalated prices for development rights when the value of development rights is largely socially created in the first place. Many land-use analysts hold the view that compensation is not a constitutional necessity when regulation seeks to prevent harm and when an important public purpose is served. Finally, permanent restrictions on the use of agricultural and other open-space lands may introduce too much inflexibility into the land-use planning process, substantially decrease the supply of developable land, and cause higher prices for developed properties.

Transferable Development Rights

In the United States transferable development rights (TDR) is among the most widely discussed new land-use management techniques. 16/ The TDR concept is based on the premise that development potential or "development rights" can be separated from the physical land itself. 17/ TDR programs authorize the transfer of these development rights from parcels of land in an area to remain undeveloped to parcels in an area to be developed.

The main advantage of the TDR concept is its role in providing economic relief to landowners for regulation-induced decreases in property value. By requiring the purchase of development rights as a prerequisite to development at increased density in unrestricted areas, the TDR mechanism relies upon the private market, rather than the public treasury, to provide compensation for rights foregone on unrestricted land.

The following basic features are common to most TDR proposals:

Lands which are to be restricted (through regulation) to low

16/ For further detail on the TDR concept see: Chavooshian (1973), Barrows (1975), Costonis (1973, 1975), Ervin, et al. (1977), Field and Conrad (1975), Rose (1975) and Woodbury (1975).

17/ A recent land-use task force sponsored by the Rockefeller Brothers Fund is among those advocating changes in property concepts to provide stability in land use. The task force stated, "In time, we believe, ownership of open spaces without urbanization rights should be as commonplace as ownership of land without mineral rights" (Reilly, 1973).

> intensity uses (such as agricultural or forest uses) must be designated by a planning agency or other public administrative body. These are areas from which development rights may be transferred. The case for this designation must be based on a finding that low intensity uses on this land are in the public interest and that market pressures will cause increased density in the absence of public intervention.
>
> The planning agency must also designate "transfer zones", areas to which development rights may be transferred and on which the purchase of development rights is a precondition to development at increased density.
>
> Finally, a set of rules must be devised to ensure the actual transfer of these rights. For example, once the preservation and development areas are identified, the planning agency would allocate a certain number of development rights to each parcel on the basis of its pre-regulation development potential. A specified number of development rights might be required for different types of development. No landowner would be originally endowed with enough rights to fully develop his land. Hence, landowners in the development zone would have an incentive to purchase development rights from landowners in the preservation zone.

Actual experience with the TDR approach has been meager. Very limited TDR proposals have been adopted by one small township in Vermont and another in New York. The TDR approach has been proposed to achieve broad objectives such as farmland retention in at least two states (Maryland and New Jersey). However, no program of this magnitude has yet been adopted.

The inability of TDR proponents to obtain legislative approval for their proposals may reflect upon the political viability of this approach to land-use control. Clearly, the TDR concept does represent a significant departure from traditional land-use controls. 18/ Considerable uncertainty as to the functioning and impacts of a TDR system also exists, making it difficult to obtain strong political support. Potential problem areas in TDR implementation include:

1. The effectiveness of a TDR system, because of its complexity, is heavily dependent on the quality of local land-use planning. In many cases the quality of local planning may not provide an adequate foundation upon which to base a TDR program (Wengert, 1974).

2. There is not widespread agreement on criteria to determine what

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18/ Ervin, et al. (1977) have stated, "While TDR's can be viewed as extensions of zoning, their implementation would require more than just marginal changes in our system of land-use planning".

level of compensation is due landowners in the preservation zone (Costonis, 1975).

3. TDR proponents have had considerable difficulty in building public confidence in the ability of the TDR system to generate sufficient private demand for development rights without imposing overly restrictive constraints on landowners in the development zone.

4. The impact of a TDR system on the prices of developable property and new housing remains unclear.

5. A TDR system may not be sufficiently flexible to be a viable land-use control technique in a growing community or region. Future planning adjustments are inevitable in a growth-oriented environment. The marketability of development rights, however, may be dependent on the permanence of land-use regulations.

Increased attention will be devoted to the TDR concept in the United States, particularly if the economic workability of this approach can be demonstrated from actual experience in the market place. If these obstacles can be overcome, the TDR approach may become an important land-use policy instrument by virtue of its ability to simultaneously avoid constitutional ("taking") and political (equity) challenges to land-use control on the one hand, and massive public expenditures on the other.

Elements of an Effective Farmland Retention Strategy

The U. S. experience with land-use controls to retain land in agricultural and other open-space uses suggests some common elements essential to effective agricultural land-use policy:

Planning-based land-use management--It perhaps goes without saying that sound land-use planning is an important prerequisite for effectiveness. Public policy efforts to guide private land-use decisions towards public goals cannot be effective unless public land-use goals are well articulated and translated into definitive and specific designations of where farmland retention is in the public interest.

Efficacy--Implicit to the notion of effectiveness is the requirement that a land-use policy instrument have the capacity to achieve the desired end. The importance of this requirement is most evident in the context of incentive programs. If the incentive offered is insufficient to alter private land-use decisions (as is apparently the case with use-value assessment), the allocation of land between uses will not be affected. Beyond this, however, it is not enough to merely prevent development on farmland. The economic vitality of agriculture in the rural-urban fringe also requires programs sensitive to the need for agricultural infrastructure, tax policy consistent with sustained agricultural use of land, and reduced economic uncertainty.

Supra-local control--Most land-use analysts probably would agree with Libby (1974) that local governments "have important strengths but retaining agriculture and open space is not one of them". Factors of more than local concern need to be brought into the land-use decision-making process. Hence, there is a need for land-use policy instruments which place some (but clearly not all) administrative authority at the state level.

Flexibility--The management of economic growth and land-use change is, by its very nature, a dynamic process. Since there will always be uncertainties preventing accurate predictions of future conditions, policy instruments must be flexible enough so that land-use decisions can be reviewed and revised when changing conditions warrant.

Constitutionality--Constitutionality is a most important element in the context of noncompensatory regulation. While some analysts argue that the scope of public regulatory powers is broader than is typically assumed, there is no consensus on how far regulation without compensation can go and not be interpreted as a "taking" under the U. S. Constitution. Policy makers and the public will remain sensitive to this issue.

Economic feasibility--The fiscal burden of alternative land-use control approaches is clearly an important criterion. For example, it seems apparent that the massive public expenditures required for public purchase of development rights programs has been a major impediment to their implementation.

Political acceptability--The political acceptability of any land-use policy instrument is dependent largely upon its anticipated impacts, the certainty and clarity with which these impacts are perceived, and the political influence of those affected. This factor is particularly important in the context of regulatory approaches. Because of the political backlash generated among property owners by noncompensatory regulation, it is argued that at least partial compensation may be necessary to make broad based regulatory programs politically acceptable. This factor may limit (for the time being, at least) the scope of noncompensatory open-space regulation in the United States to very sharply focused, limited-purpose programs in which the public purpose is obvious, tangible, and widely supported. Public decision makers, nevertheless, must also recognize that what is politically acceptable may change over time due to changes in social values, citizen awareness, and the intensity of political participation among different interest groups.

Concluding Comments

The arguments for and against increased public governance of the use of private lands are not addressed in this report. Rather, the report assumes the need for better land resource protection programs and, more specifically, that conversion of agricultural lands to other uses should be by deliberate choice rather than by default.

This is not to say, however, that the case for increased public intervention has been fully developed and is overwhelmingly strong. The lack of conclusive research results on the value to society of farmland and open-space retention has been an important impediment to decisive public action. Difficult land-use policy choices will not be made until we go beyond intuition and rhetoric and provide detailed scientific evidence on the social costs of public inaction.

A few emerging trends and issues on agricultural and open-space land-use policy in the United States seem worth mentioning and/or repeating:

> There is increasing recognition of the need to control the forces stimulating urban/suburban expansion. Effective growth management programs may help reduce urban/suburban pressures on the rural landscape and thereby increase the effectiveness of well designed farmland retention programs.
>
> As is true in the case of general land-use management programs, the role of the state in agricultural and open-space land-use planning and policy has increased. An increased state role will stimulate local governments to increase their land-use management capabilities.
>
> Public policy makers are more aware of the need to exploit the complementarities among different land-use control techniques.
>
> The issue of what is "fair" compensation for regulation-induced reductions in property value will become more important. As the need for accommodation of the legitimate interests of both government and private landowners becomes increasingly evident, the search for programs based on compromise will intensify.
>
> The virtues of incrementalism in land resource protection programs are becoming more widely appreciated.
>
> A general tendency may be emerging toward sharply-focused, limited-purpose programs to retain the most productive agricultural lands.

Agricultural and open-space land-use policy in the United States is still in its infancy. The United States experience is limited, but expanding. For those with an appreciation for diversity and innovation in approaches to public governance of private property, the United States experience in the next decade will be well worth watching.

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